WHAT IS CLAIMED IS:

1. A manual input device comprising:

a rotatable operating member;

a motor that exerts a rotational force on the operating member, the motor having an output shaft;

a planet gear mechanism having a sun gear fixed to the output shaft of the motor, a plurality of planet gears engaging and moving around the sun gear, a ring gear engaging the planet gears on the inner peripheral side thereof, a carrier that rotatably supports the planet gears and rotates along with movement of the planet gears around the sun gear, and a carrier shaft that rotates integrally with the carrier and the operating member;

a detector that detects at least one of a direction of rotation and an amount of rotation of the output shaft of the motor;

a controller that controls the motor such that a predetermined rotational force is exerted on the operating member dependent on the at least one of the direction of rotation and the amount of rotation of the output shaft detected by the detector; and

a motor holder having at least one projection which abuts against at least one side surface of an end portion of the motor, the at least one projection disposed on a first side of the motor holder opposite from an output shaft side of the motor holder, the at least one projection configured to hold the motor.

2. The manual input device according to Claim 1, wherein at least one pair of projections is provided such that each pair

of projections are disposed at opposite locations with the intermediary of a centerline of the output shaft.

3. The manual input device according to Claim 2, wherein a plurality of pairs of projections are provided.

4. The manual input device according to Claim 1, wherein the motor holder has a single projection that abuts an entire periphery of the side surfaces of the end portion of the motor on the first side of the motor holder.

5. The manual input device according to Claim 1, wherein the motor holder comprises:

a plurality of side plates disposed on a second side of the motor in parallel with the output shaft;

a first end plate opposing a first end surface of the motor on a side of the output shaft; and

a second end plate opposing a second end surface of the motor on a side opposite from the output shaft side,

wherein the side plates are provided with the at least one projection,

wherein the first end plate contains a first end plate strip integrated with a first side plate of the side plates and a second end plate strip integrated with a second side plate of the side plates,

wherein the second end plate includes a first hinge unit that rotatably supports the first side plate such that the first

end plate strip is moveable away from the second end plate strip, and a second hinge unit that rotatably supports the second side plate such that the second end plate strip is moveable away from the first end plate strip, and

wherein each of the first and second end plate strip has a notch forming a hole thorough which the output shaft is arranged.

6. The manual input device according to Claim 1, wherein the motor is pivotable by 360° about the at least one projection.

7. The manual input device according to Claim 1, further comprising a limiting member to which the carrier is attached and that limits movement of the planet gears in an axial direction.

8. The manual input device according to Claim 7, wherein:

the carrier has a disk portion and has connecting portions that extend along a periphery of the disk portion in the axial direction and that are connected to the limiting member, the connecting portions have projections projecting in the axial direction and snap claws projecting in a direction orthogonal to the axial direction, and

the limiting member has a disk portion and has connecting portions that extend along the periphery of the disk portion corresponding to the connecting portions of the carrier, the connecting portions of the limiting member have openings with which the snap claws engage, and the disk potion of the limiting member includes holes to which the projections of the connecting portions

are fitted.

9. The manual input device according to Claim 1, wherein the detector comprises:

an encoder having a code plate formed integrally with the sun gear;

a light emitting unit; and

a light receiving unit opposing the light emitting unit with the intermediary of the code plate.

10. The manual input device according to Claim 9, further comprising:

a circuit board fixed to an end surface of the motor with a bracket, the light emitting unit and the light receiving unit connected to the circuit board; and

a holder fixed to the circuit board and holding the light emitting unit and the light receiving unit.

11. The manual input device according to Claim 1, further comprising an annular member to which the motor holder is snap-fitted, the motor holder contacting an internal surface of the annular member, wherein snap claws provided on side plates of the motor holder engage with engaging holes formed on the annular member, and the ring gear is formed in the annular member.

12. A method of manufacturing a manual input device, the method comprising:

obtaining a rotatable operating member;

connecting a motor with the operating member such that the motor exerts a rotational force on the operating member;

attaching a sun gear to an output shaft of the motor;

coupling a plurality of planet gears with the sun gear such that the planet gears engage and move around the sun gear;

coupling a ring gear with the planet gears such that the planet gears engage an inner peripheral side of the ring gear;

rotatably supporting the planet gears with a carrier that rotates along with movement of the planet gears around the sun gear;

configuring a detector to detect at least one of a direction of rotation and an amount of rotation of the output shaft of the motor;

configuring a controller to control the motor such that a predetermined rotational force is exerted on the operating member dependent on the at least one of the direction of rotation and the amount of rotation of the output shaft detected by the detector; and

holding the motor using a motor holder having at least one projection that abuts against at least one side surface of an end portion of the motor, the at least one projection disposed on a first side of the motor holder opposite from an output shaft side of the motor holder, the at least one projection configured to hold the motor.

13. The method according to Claim 12, further comprising

providing at least one pair of projections such that each pair of projections are disposed at opposite locations with the intermediary of a centerline of the output shaft.

14. The manual input device according to Claim 13, further comprising providing a plurality of pairs of projections.

15. The method according to Claim 12, further comprising providing only a single projection that abuts an entire periphery of the side surfaces of the end portion of the motor on the first side of the motor holder.

16. The method according to Claim 12, wherein the motor holder comprises a plurality of side plates disposed on a second side of the motor in parallel with the output shaft, a first end plate opposing a first end surface of the motor on a side of the output shaft, and a second end plate opposing a second end surface of the motor on a side opposite from the output shaft side,

wherein the side plates are provided with the at least one projection, the first end plate contains a first end plate strip integrated with a first side plate of the side plates and a second end plate strip integrated with a second side plate of the side plates, and

the method further comprises rotatably supporting the first side plate with a first hinge unit of the second end plate such that the first end plate strip is moveable away from the second end plate strip, rotatably supporting the second side plate with

a second hinge unit such that the second end plate strip is moveable away from the first end plate strip, and arranging the output shaft through a notch in each of the first and second end plate strip.

17. The method according to Claim 12, further comprising disposing the motor in the motor holder such that the motor is pivotable by 360° about the at least one projection.

18. The method according to Claim 12, further comprising attaching a limiting member to the carrier thereby limiting movement of the planet gears in an axial direction.

19. The method according to Claim 18, wherein:

the carrier has a disk portion and has connecting portions that extend along a periphery of the disk portion in the axial direction and that are connected to the limiting member, the connecting portions have projections projecting in the axial direction and snap claws projecting in a direction orthogonal to the axial direction,

the limiting member has a disk portion and has connecting portions that extend along the periphery of the disk portion corresponding to the connecting portions of the carrier, and

the method further comprises engaging the snap claws with openings of the connecting portions of the limiting member and fitting the projections of the connecting portions to holes in the disk potion of the limiting member.

20. The method according to Claim 12, further comprising disposing a light emitting unit and a light receiving unit of the detector such that the light receiving unit opposes the light emitting unit with the intermediary of a code plate of an encoder, the code plate formed integrally with the sun gear.

21. The method according to Claim 20, further comprising fixing a circuit board to an end surface of the motor with a bracket, the light emitting unit and the light receiving unit connected to the circuit board, a holder fixed to the circuit board and holding the light emitting unit and the light receiving unit.

22. The method according to Claim 12, further comprising snap-fitting an annular member to the motor holder such that the motor holder contacts an internal surface of an annular member, the annular member being snap-fitted through engagement of snap claws provided on side plates of the motor holder with engaging holes formed on the annular member, the ring gear being formed in the annular member.

23. A manual input device comprising:

a rotatable operating member;

a motor that exerts a rotational force on the operating member, the motor having an output shaft;

a planet gear mechanism having a sun gear fixed to the output shaft of the motor, a plurality of planet gears engaging and moving around the sun gear, a ring gear engaging the planet gears on the

inner peripheral side thereof, a carrier that rotatably supports the planet gears and rotates along with movement of the planet gears around the sun gear, and a carrier shaft that rotates integrally with the carrier and the operating member; and

a motor holder having at least one projection which abuts against at least one side surface of the motor and is configured to hold the motor such that the sun gear is pivotable with respect to the planet gear by pivoting the motor about the at least one projection of the motor holder.

24. The manual input device according to Claim 23, wherein, engagement between the sun gear and the planet gears is adjustable solely through pivoting of the motor about the at least one projection of the motor holder.

25. The manual input device according to Claim 23, wherein at least one pair of projections is provided such that each pair of projections are disposed at opposite locations with the intermediary of a centerline of the output shaft.

26. The manual input device according to Claim 25, wherein a plurality of pairs of projections are provided.

27. The manual input device according to Claim 23, wherein the motor holder has a single projection that abuts an entire periphery of the side surfaces of the motor.

28. The manual input device according to Claim 23, wherein the motor is pivotable by 360° about the at least one projection.

29. The manual input device according to Claim 23, wherein the motor holder comprises:

a plurality of side plates disposed on a side of the motor in parallel with the output shaft;

a first end plate opposing a first end surface of the motor on a side of the output shaft; and

a second end plate opposing a second end surface of the motor on a side opposite from the output shaft side,

wherein the side plates are provided with the at least one projection,

wherein the first end plate contains a first end plate strip integrated with a first side plate of the side plates and a second end plate strip integrated with a second side plate of the side plates,

wherein the second end plate includes a first hinge unit that rotatably supports the first side plate such that the first end plate strip is moveable away from the second end plate strip, and a second hinge unit that rotatably supports the second side plate such that the second end plate strip is moveable away from the first end plate strip, and

wherein each of the first and second end plate strip has a notch forming a hole thorough which the output shaft is arranged.

30. The manual input device according to Claim 23, further

comprising a limiting member to which the carrier is attached and that limits movement of the planet gears in an axial direction.

31. The manual input device according to Claim 30, wherein:

the carrier has a disk portion and has connecting portions that extend along a periphery of the disk portion in the axial direction and that are connected to the limiting member, the connecting portions have projections projecting in the axial direction and snap claws projecting in a direction orthogonal to the axial direction, and

the limiting member has a disk portion and has connecting portions that extend along the periphery of the disk portion corresponding to the connecting portions of the carrier, the connecting portions of the limiting member have openings with which the snap claws engage, and the disk potion of the limiting member includes holes to which the projections of the connecting portions are fitted.

32. The manual input device according to Claim 23, further comprising an annular member to which the motor holder is snap-fitted, the motor holder contacting an internal surface of the annular member, wherein snap claws provided on side plates of the motor holder engage with engaging holes formed on the annular member, and the ring gear is formed in the annular member.